

Claims

What is claimed is:

1. A battery pack apparatus comprising:

5 a battery pack including a plurality of rechargeable batteries arranged in parallel, the rechargeable batteries having heat medium passages formed therebetween;

a heat insulation cover formed from a heat insulation material for covering a circumferential surface of the battery pack substantially entirely with a supply passage and a
10 discharge passage provided between the heat insulation cover and the battery pack, the supply passage supplying a heat medium to the heat medium passages while the discharge passage discharging the heat medium from the heat medium passages; and

15 a supply device for supplying the heat medium to the supply passage.

2. The battery pack apparatus according to claim 1, wherein

a covering layer formed by metal foil is provided on an outer surface of the heat insulation cover.

20 3. The battery pack apparatus according to claim 1, further comprising a heating/cooling device having a heating device for heating the heat medium and a cooling device for cooling the heat medium.

25 4. The battery pack apparatus according to claim 3, wherein

the cooling device comprises a heat exchanger for introducing a cooling medium so as to cool the heat medium.

5. The battery pack apparatus according to claim 3, wherein

5 the heating device comprises any one of a PTC heater and a Peltier device for heating the heat medium.

6. The battery pack apparatus according to claim 1, wherein

a valve is provided at each of an entrance of the supply
10 passage and an exit of the discharge passage, the valve being capable of opening toward a direction of the flow of the heat medium, the valve usually being forced to a closed position.

7. The battery pack apparatus according to claim 6, wherein

15 a gas-escape passage is provided at an upper end of a space closed by the valve within the heat insulation cover.

8. The battery pack apparatus according to claim 1, wherein

a control unit for controlling charge and discharge of
20 the rechargeable batteries is arranged next to the battery pack and is accommodated in the heat insulation cover.

9. The battery pack apparatus according to claim 8, wherein

an expanded space is formed in a region near and above
25 the control unit in the space within the heat insulation cover

to expand upward, and has an opening for opening the upper end of the expanded space to the outside.

10. The battery pack apparatus according to claim 3, wherein

5 the supply device and the heating/cooling device are arranged next to the battery pack and is accommodated in the heat insulation cover, and

 a discharge side of the supply device is connected to the supply passage via the heating/cooling device.

10 11. The battery pack apparatus according to claim 3, wherein

 the supply device and the heating/cooling device are arranged next to the battery pack and is accommodated in the heat insulation cover, and

15 an intake side of the supply device is connected to the discharge passage via the heating/cooling device.

 12. The battery pack apparatus according to claim 10 or 11, wherein

20 a drain passage for draining drops of dew formed in the cooling device to the outside of the heat insulation cover is provided.

 13. The battery pack apparatus according to claim 10 or 11, wherein

25 a water absorbing sheet is attached to an outer surface of a duct for connecting the supply passage or the discharge

passage, and the supply device.

14. The battery pack apparatus according to claim 10 or 11, wherein

a duct for connecting the supply passage or the discharge
5 passage, and the supply device is formed from a heat
insulation material.